

What is claimed is:

1. An articulation segment of a catheter for selectively bending the catheter in a plurality of planes, the articulation segment comprising: a hollow tube having a wall and defining a longitudinal axis, the tube being formed with
5 a first slit through the wall lying in a plane substantially perpendicular to the axis and extending azimuthally in an arc partway around the axis; the tube being further formed with a second slit through the wall lying in a plane substantially perpendicular to the axis and extending azimuthally in an arc partway around the axis; wherein the first slit is axially and azimuthally offset
10 from the second slit to allow for the selective bending of the catheter.
2. An articulation segment as recited in claim 1 wherein the tube is formed with a plurality of the first slits, with the plurality of first slits being aligned along the axis in a same azimuthal orientation relative to each other; and wherein the tube is formed with a plurality of the second slits, with the
15 plurality of second slits being aligned along the axis in a same azimuthal orientation relative to each other.
3. An articulation segment as recited in claim 2 wherein each first slit has a first end and a second end; wherein each second slit has a first end and a second end; and wherein the first end of the first slit is juxtaposed and overlaps with the second end of an adjacent second slit, and the second end of the first slit is juxtaposed and overlaps with the first end of an adjacent second slit.
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4. An articulation segment as recited in claim 3 with each first slit and each second slit having a substantially same arc length, wherein the arc
25 length is greater than one hundred and eighty degrees.

5. An articulation segment as recited in claim 4 wherein the respective ends of the first slits and the second slits overlap through an arc distance of approximately ten degrees.

6. An articulation segment as recited in claim 2 wherein the
5 plurality of first slits comprise a first set of slits and the plurality of second slits comprise a second set of slits; and wherein the tube is further formed with a third set of slits diametrically opposed to the first set of slits with respective slits of the first set lying in a same plane with a corresponding slit of the third set, and further wherein the tube is formed with a fourth set of slits
10 diametrically opposed to the second set of slits with respective slits of the second set lying in a same plane with a corresponding slit of the fourth set.

7. An articulation segment as recited in claim 6 wherein each slit of the first set, second set, third set and fourth set have a substantially same arc length greater than ninety degrees and less than one hundred and eighty
15 degrees.

8. An articulation segment as recited in claim 2 wherein each slit has a width in a range of approximately ten to five hundred microns.

9. An articulation segment as recited in claim 1 wherein the tube is a hypotube made of stainless steel.

10. An articulation segment of a catheter for selectively bending the catheter in a plurality of planes, the articulation segment comprising: a hollow tube having a wall and defining an axis and formed with a plurality of first slits each having a center and a substantially same arc length, with the plurality of
5 first slits cut into the tube through the wall in planes substantially perpendicular to the axis with their respective centers aligned substantially parallel to the axis; the tube being further formed with a plurality of second slits each having a center and a substantially same arc length, with the plurality of second slits cut into the tube through the wall in planes substantially perpendicular to the axis with their respective centers aligned substantially parallel to the axis; wherein the centers of the plurality of first slits are azimuthally offset from the centers of the plurality of second slits, and the plurality of first slits are axially offset from adjacent slits in the plurality of second slits to allow for the selective bending of the catheter.
- 10 15 11. An articulation segment as recited in claim 10 wherein each first slit has a first end and a second end; wherein each second slit has a first end and a second end; and wherein the first end of the first slit is juxtaposed and overlaps with the second end of an adjacent second slit, and the second end of the first slit is juxtaposed and overlaps with the first end of an adjacent
20 second slit.
12. An articulation segment as recited in claim 11 with each first slit and each second slit having a substantially same arc length, wherein the arc length is greater than one hundred and eighty degrees.
- 25 13. An articulation segment as recited in claim 12 wherein the respective ends of the first slits and the second slits overlap through an arc distance of approximately ten degrees.
14. An articulation segment as recited in claim 10 wherein each slit has a width in a range of approximately ten to five hundred microns.

15. An articulation segment as recited in claim 10 wherein the tube is a hypotube made of stainless steel.

16. A method for manufacturing an articulation segment for a catheter to allow for a selective bending of the catheter in a plurality of planes, 5 the method comprising the steps of:

providing a hollow tube having a wall and defining a longitudinal axis;

10 orienting a laser system to cut a plurality of first slits into the tube through the wall with the first slits lying in respective planes substantially perpendicular to the axis and with each first slit having a same azimuthal orientation and extending in an arc partway around the axis and having a center aligned with the centers of other first slits along a first line substantially parallel to the axis; and

15 using the system to cut a plurality of second slits into the tube through the wall with the second slits lying in respective planes substantially perpendicular to the axis and with each second slit having a same azimuthal orientation and extending in an arc partway around the axis and having a center aligned with the centers of other second slits along a second line substantially parallel to the axis, wherein slits 20 in the plurality of first slits are axially offset from slits in the plurality of second slits, and wherein the first line is azimuthally offset from the second slit line to allow for the selective bending of the catheter.

17. A method as recited in claim 16 wherein each first slit has a first end and a second end; wherein each second slit has a first end and a second 25 end; and wherein the first end of the first slit is juxtaposed and overlaps with the second end of an adjacent second slit, and the second end of the first slit is juxtaposed and overlaps with the first end of an adjacent second slit.

18. A method as recited in claim 17 with each first slit and each second slit having a substantially same arc length, wherein the arc length is greater than one hundred and eighty degrees and wherein the respective ends of the first slits and the second slits overlap through an arc distance of
5 approximately ten degrees.

19. A method as recited in claim 16 further comprising the steps of:
orienting the system to cut a plurality of third slits into the tube
with the third slits being coplanar with the first slits, and with each third
slit extending azimuthally in an arc partway around the axis and having
10 a center aligned with the centers of other third slits along a third line
substantially parallel to the axis; and
using the system to cut a plurality of fourth slits into the tube with
the fourth slits being coplanar with the second slits, and with each
fourth slit extending azimuthally in an arc partway around the axis and
having a center aligned with the centers of other fourth slits along a
15 fourth line substantially parallel to the axis, wherein the third line is
diametrically opposed to the first line and the fourth line is diametrically
opposed to the second line to allow for the selective bending of the
catheter.
20. A method as recited in claim 19 wherein each slit has a
substantially same arc length greater than ninety degrees and less than one
hundred and eighty degrees and has a width in a range of approximately ten
to five hundred microns.